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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/817,591	03/26/2001	Yihong Gong	CA1122	7751

23493 7590 08/15/2007

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EXAMINER	
TRAN, QUOC A	

ART UNIT	PAPER NUMBER
2176	

MAIL DATE	DELIVERY MODE
08/15/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/817,591	GONG ET AL.	
	Examiner	Art Unit	
	Tran A. Quoc	2176	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 January 1932*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This is a **Final Rejection** in response to the Reponses filed 06/19/2007.

Claims 1-32 are pending and rejected in this action. Claims 1, 9, 13, 21, 26, and 29 are independent claims.

Effective filing date 03/26/2001, which claims benefit of 60/254,535 filed 12/12/2000 (NEC).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> ***(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.***

Claims 1-32 are rejected under 35 U.S.C. 103(a) as being unpatentable by Billheimer et al. US Patent No. 6,611,825 B1 - filed 06/09/1999 (hereinafter Billheimer), in view of Goldstein et al. " Summarizing Text Documents: Sentence Selection and Evaluation Metrics" published 08/1999 by ACM Press (hereinafter Goldstein), further in view of Goldstein et al. "Multi-Document Summarization By Sentence Extraction" published 04/2000 by ACM Press (hereinafter Goldstein's Sentence Extraction).

Regarding independent claim 1, Billheimer teaches:

A method of creating a generic text summary of a document; said method comprising: creating a weighted document term-frequency vector for said document;

(See, Billheimer at col. 4, line 35 through col. 6, line 40, discloses summarization of individual documents and groups of documents, and document cross-referencing using a term frequency matrix of the term frequencies for each of the documents. Using the broadest reasonable interpretation, the Examiner reads the claimed a weighted document term-frequency vector as equivalent to a term frequency matrix of the term frequencies for each of the documents as taught by Billheimer.

In addition, Billheimer does not explicitly teach, but Goldstein teaches:

for each sentence in said document, creating a weighted sentence term-frequency vector; computing a score for each said weighted sentence term-frequency vector in accordance with relevance to said weighted document.

(See, Goldstein at pages 121-122, discloses the method of generating summaries by text extraction, wherein sentence is scored using a centroid query vector.

Also, see Goldstein at pages 121-122, discloses the method of generating summaries by text extraction, wherein each sentence is scored according to the following formula and then ordered in a summary according to rank order,

$$Score(S_i) = \lambda \sum_{s \in S} w_s * (Q_s \cdot S_i) + (1 - \lambda) * \sum_{l \in L} w_l * (L_l \cdot S_i)$$

where S is the set of statistical features, L is the set of linguistic features, Q is the query, and w is the weights for the features in that set. These weights can be tuned according to the type of data set used and the type of summary desired.

In addition, Goldstein teaches:

selecting a sentence for inclusion in said generic text summary in accordance with said computing;

Also, see Goldstein at pages 121-122, discloses the method of generating summaries by text extraction, wherein each sentence is scored according to the following formula and then ordered in a summary according to rank order.

$$Score(S_i) = \lambda \sum_{s \in S} w_s * (Q_s \cdot S_i) + (1 - \lambda) * \sum_{l \in L} w_l * (L_l \cdot S_i)$$

where S is the set of statistical features, L is the set of linguistic features, Q is the query, and w is the weights for the features in that set. These weights can be tuned according to the type of data set used and the type of summary desired. The evaluators also marked each document as relevant or not relevant to the topic and selected the three most relevant sentences for each article from the sentences that they had marked relevant (yielding a most relevant sentence data set of 1-9 sentences per document). This set has an average of 5.6 sentences per document and
58.2% of the relevant sentence summaries contain the first sentence.)

In addition, Billheimer and Goldstein do not explicitly teach, but Goldstein's Sentence Extraction teaches:

deleting said sentence from said document and eliminating terms in said sentence from said document.

(See, Goldstein's Sentence Extraction at page 40 Title, discloses multi-document summarization by sentence extraction.

Also, see Goldstein's Sentence Extraction fig. 1 –3, and at pages 44 right-col bottom through page 45 left-col bottom, discloses multi-document summarization by sentence extraction. For example, Figure 2 depict sentences from (#1- #10 with rank order), wherein sentences #2, #4, #6, and #9, which constitutes 70% of the sentences in the summary. Furthermore, sentence #3 is an exact duplicate of sentence #2, and sentence #7 is almost identical to sentence #4. Finally, the new summary retained only three of the sentences from the earlier summary. Using the broadest reasonable interpretation, the Examiner equates the claimed deleting said sentence from said document as equivalent to document summarization by sentence extraction as taught by Goldstein's Sentence Extraction.

$$MMR\text{-}MD \stackrel{def}{=} Arg \max_{P_{ij} \in R \setminus S} \left[\lambda (Sim_1(P_{ij}, Q, C_{ij}, D_i, D)) - (1-\lambda) \max_{P_{nm} \in S} Sim_2(P_{ij}, P_{nm}, C, S, D_i)) \right]$$

$$Sim_1(P_{ij}, Q, C_{ij}, D_i, D) = w_1 * (P_{ij} \cdot Q) + w_2 * coverage(P_{ij}, C_{ij}) + w_3 * content(P_{ij}) + w_4 * time\_sequence(D_i, D)$$

$$Sim_2(P_{ij}, P_{nm}, C, S, D_i) = w_a * (P_{ij} \cdot P_{nm}) + w_b * clusters\_selected(C_{ij}, S) + w_c * documents\_selected(D_i, S)$$

$$coverage(P_{ij}, C) = \sum_{k \in C_{ij}} w_k * |k|$$

$$content(P_{ij}) = \sum_{W \in P_{ij}} w_{type}(W)$$

$$time\_sequence(D_i, D) = \frac{timestamp(D_{maxtime}) - timestamp(D_i)}{timestamp(D_{maxtime}) - timestamp(D_{mintime})}$$

$$clusters\_selected(C_{ij}, S) = |C_{ij} \cap \bigcup_{v,w:P_{vw} \in S} C_{vw}|$$

$$documents\_selected(D_i, S) = \frac{1}{|D_i|} * \sum_{w} [P_{iw} \in S]$$

where
Sim_1 is the similarity metric for relevance ranking
Sim_2 is the anti-redundancy metric
D is a document collection
P is the passages from the documents in that collection (e.g., P_{ij} is passage j from document D_i)
Q is a query or user profile
$R = IR(D, P, Q, \theta)$, i.e., the ranked list of passages from documents retrieved by an IR system, given D, P, Q and a relevance threshold θ, below which it will not retrieve passages (θ can be degree of match or number of passages)
S is the subset of passages in R already selected
$R \setminus S$ is the set difference, i.e., the set of as yet unselected passages in R
C is the set of passage clusters for the set of documents
C_{vw} is the subset of clusters of C that contains passage P_{vw}
C_v is the subset of clusters that contain passages from document D_v
$|k|$ is the number of passages in the individual cluster k
$|C_{vw} \cap C_{ij}|$ is the number of clusters in the intersection of C_{vw} and C_{ij}
w_i are weights for the terms, which can be optimized
W is a word in the passage P_{ij}
type is a particular type of word, e.g., city name
$|D_i|$ is the length of document i.

Figure 1: Definition of multi-document summarization algorithm - MMR-MD

1. **WSJ910204-0176: 1** CAPE TOWN, South Africa – President F.W. de Klerk's proposal to repeal the major pillars of apartheid drew a generally positive response from black leaders, but African National Congress leader Nelson Mandela called on the international community to continue economic sanctions against South Africa until the government takes further steps.
2. **AP880803-0082: 25** Three Canadian anti-apartheid groups issued a statement urging the government to sever diplomatic and economic links with South Africa and aid the African National Congress, the banned group fighting the white-dominated government in South Africa.
3. **AP880803-0080: 25** Three Canadian anti-apartheid groups issued a statement urging the government to sever diplomatic and economic links with South Africa and aid the African National Congress, the banned group fighting the white-dominated government in South Africa.
4. **AP880802-0165: 23** South Africa says the ANC, the main black group fighting to overthrow South Africa's white government, has seven major military bases in Angola, and the Pretoria government wants those bases closed down.
5. **AP880212-0060: 14** ANGOP quoted the Angolan statement as saying the main causes of confict in the region are South Africa's "illegal occupation" of Namibia, South African attacks against its black-ruled neighbors and its alleged creation of armed groups to carry out "terrorist activities" in those countries, and the denial of political rights to the black majority in South Africa.
6. **AP880823-0069: 17** The ANC is the main guerrilla group fighting to overthrow the South African government and end apartheid, the system of racial segregation in which South Africa's black majority has no vote in national affairs.
7. **AP880803-0158: 26** South Africa says the ANC, the main black group fighting to overthrow South Africa's white-led government, has seven major military bases in Angola, and it wants those bases closed down.
8. **AP880613-0126: 15** The ANC is fighting to topple the South African government and its policy of apartheid, under which the nation's 26 million blacks have no voice in national affairs and the 5 million whites control the economy and dominate government.
9. **AP880212-0060: 13** The African National Congress is the main rebel movement fighting South Africa's white-led government and SWAPO is a black guerrilla group fighting for independence for Namibia, which is administered by South Africa.
0. **WSJ870129-0051: 1** Secretary of State George Shultz, in a meeting with Oliver Tambo, head of the African National Congress, voiced concerns about Soviet influence on the black South African group and the ANC's use of violence in the struggle against apartheid.

Figure 2: Sample multi-document summary with $\lambda = 1$, news-story-principle ordering (rank order)

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Billheimer teaching, wherein creating a weighted document term-frequency vector for said document, to includes a means of creating, selecting a weighted sentence term-frequency vector for each sentence in said document by computing a score for each said weighted sentence term-frequency vector in accordance with relevance to said weighted document, and deleting said sentence from said document of Goldstein, and Goldstein's Sentence Extraction . One of ordinary skill in the art would have been motivated to perform such a modification to produce a query-relevant summary base upon the a weighted sentence term-frequency vector and accordance with relevance to said weighted document (Goldstein at pages 121-122).)

Regarding independent claim 9, Billheimer teaches:

> **A system for creating a generic text summary of a document; said system comprising: a computer; a display for displaying said generic text summary; and summarizer program code, operable on said computer, for analyzing and summarizing said document; said summarizer program code comprising:**

(See, Billheimer at col. 8 line 25 through col. 9, line 5, also see Fig. 2, teaching computer system suitable for implementing the method of summarization of individual documents and groups of documents, and document cross-referencing using a term frequency matrix of the term frequencies for each of the documents.

In addition, Billheimer teaches:

a vector generator for creating a weighted document term-frequency vector for said document;

Also, see, Billheimer at col. 4, line 35 through col. 6, line 40, discloses summarization of individual documents and groups of documents, and document cross-referencing using a term frequency matrix of the term frequencies for each of the documents. Using the broadest reasonable interpretation, the Examiner reads the claimed a weighted document term-frequency vector as equivalent to a term frequency matrix of the term frequencies for each of the documents as taught by Billheimer.

In addition, Billheimer does not explicitly teach, but Goldstein teaches:

creating a weighted sentence term-frequency vector for each sentence in said document; a scoring engine for computing a score for each said weighted sentence term-frequency vector in accordance with relevance to said weighted document term-frequency vector; and a selector for selecting a sentence for inclusion in said generic text summary in accordance with output results from said scoring engine

(See, Goldstein at pages 121-122, discloses the method of generating summaries by text extraction, wherein sentence is scored using a centroid query vector.

Also, see Goldstein at pages 121-122, discloses the method of generating summaries by text extraction, wherein each sentence is scored according to the following formula and then ordered in a summary according to rank order,

$$Score(S_i) = \lambda \sum_{s \in S} w_s * (Q_s \cdot S_i) + (1 - \lambda) * \sum_{l \in L} w_l * (L_l \cdot S_i)$$

where S is the set of statistical features, L is the set of linguistic features, Q is the query, and w is the weights for the features in that set. These weights can be tuned according to the type of data set used and the type of summary desired.

In addition, Billheimer and Goldstein do not explicitly teach, but Goldstein's Sentence Extraction teaches:

> **and a document editor for deleting said sentence from said document and for eliminating terms in said sentence from said document.**

(See, Goldstein's Sentence Extraction at page 40 Title, discloses multi-document summarization by sentence extraction.

Also, see Goldstein's Sentence Extraction fig. 1 –3, and at pages 44 right-col bottom through page 45 left-col bottom, discloses multi-document summarization by sentence extraction. For example, Figure 2 depict sentences from (#1- #10 with rank order), wherein sentences #2, #4, #6, and #9, which constitutes 70% of the sentences in the summary. Furthermore, sentence #3 is an exact duplicate of sentence #2, and sentence #7 is almost identical to sentence #4. Finally, the new summary retained only three of the sentences from the earlier summary. Using the broadest reasonable interpretation, the Examiner equates the claimed deleting said sentence from said document as equivalent to document summarization by sentence extraction as taught by Goldstein's Sentence Extraction.

Also, see Goldstein's Sentence Extraction section 5 System Design right col-middle, teaching segment the documents into passages (passages may be phrases, sentences, n-sentence chunks, or paragraphs, and index them using inverted indices (as used by the IR engine). Using the broadest reasonable interpretation, the Examiner equates the claimed editor as equivalent to the IR engine as taught by Goldstein's Sentence Extraction.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Billheimer, Goldstein, and Goldstein's Sentence to produce a query-relevant summary base upon the a weighted sentence term-frequency vector and accordance with relevance to said weighted document (Goldstein at pages 121-122), and provides document summarization by sentence extraction as taught by Goldstein's Sentence Extraction.

Regarding independent claim 13,

the rejection of claim 1 is fully incorporated.

In addition, Billheimer and Goldstein do not explicitly teach, but Goldstein's Sentence Extraction teaches:

recreating said weighted document term-frequency vector in accordance with said deleting and said eliminating.

(See, Goldstein's Sentence Extraction fig. 1 –3, and at pages 44 right-col bottom through page 45 left-col bottom, discloses multi-document summarization by sentence extraction. For example, Figure 2 depict sentences from (#1- #10 with rank order),

wherein sentences #2, #4, #6, and #9, which constitutes 70% of the sentences in the summary. Furthermore, sentence #3 is an exact duplicate of sentence #2, and sentence #7 is almost identical to sentence #4. Finally, the new summary retained only three of the sentences from the earlier summary. Using the broadest reasonable interpretation, the Examiner equates the claimed as equivalent to the new summary retained only three of the sentences from the earlier summary as taught by Goldstein's Sentence Extraction.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Billheimer teaching, wherein creating a weighted document term-frequency vector for said document, to includes a means of creating, selecting a weighted sentence term-frequency vector for each sentence in said document by computing a score for each said weighted sentence term-frequency vector in accordance with relevance to said weighted document, and deleting said sentence from said document of Goldstein, and Goldstein's Sentence Extraction . One of ordinary skill in the art would have been motivated to perform such a modification to produce a query-relevant summary base upon the a weighted sentence term-frequency vector and accordance with relevance to said weighted document (Goldstein at pages 121-122).)

Regarding independent claim 21,

the rejection of claim 1 is fully incorporated. In addition, Billheimer teaches:

A system for creating a generic text summary of a document; said system comprising: a computer; a display for displaying said generic text summary; and summarizer program code, operable on said computer, for analyzing and summarizing said document; said summarizer program code comprising:

(See, Billheimer at col. 8 line 25 through col. 9, line 5, also see Fig. 2, teaching computer system suitable for implementing the method of summarization of individual documents and groups of documents, and document cross-referencing using a term frequency matrix of the term frequencies for each of the documents.

In addition, Billheimer and Goldstein's Sentence Extraction do not expressly teach, but Goldstein teaches:

a vector generator for creating a weighted document term-frequency vector for said document;

(See, Goldstein at pages 121-122, discloses the method of generating summaries by text extraction, wherein scoring sentences with respect to both statistical and linguistic features such that a centroid query vector is calculated using high frequency document words and the title of the document wherein each sentence is scored accordingly (e.g. using Score formula on page 122) and then ordered in a summary according to rank order, wherein each sentence is scored according to the following formula and then ordered in a summary according to rank order,

$$Score(S_i) = \lambda \sum_{s \in S} w_s * (Q_s \cdot S_i) + (1 - \lambda) * \sum_{l \in L} w_l * (L_l \cdot S_i)$$

where S is the set of statistical features, L is the set of linguistic features, Q is the query, and w is the weights for the features in that set. These weights can be tuned according to the type of data set used and the type of summary desired) Examiner read the above in the broadest reasonable interpretation to the claim limitation, wherein a vector generator would have been an obvious variant of scoring sentences with respect to both statistical and linguistic features such that a centroid query vector is calculated using high frequency document words and the title of the document wherein each sentence is scored accordingly (e.g. using Score formula on page 122) and then ordered in a summary according to rank order, to a person of ordinary skill in the art at the time the invention was made.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Billheimer and Goldstein's Sentence Extraction teaching, to include a means of creating a weighted document term-frequency vector for said document from a vector generator of Goldstein's teaching. One of ordinary skill in the art would have been motivated to perform such a modification to produce a query-relevant summary base upon the a weighted sentence term-frequency vector and accordance with relevance to said weighted document (Goldstein at pages 121-122).

Regarding independent claim 26, the rejection of claim 9 is fully incorporated. In addition,

Billheimer teaches:

an SVD performer for performing singular value decomposition on said terms-by-sentences matrix to generate a singular value matrix and a right singular vector matrix;

(See, Billheimer at col. 3 lines 55-60, teaching latent semantic indexing (LSI), and singular value decomposition (SVD).

Also, see Goldstein at page 122 section 2 Generating Summaries by Text Extraction para 3, teaching summaries by scoring sentences. Using the broadest reasonable interpretation the Examiner equates the claimed SVD performer for performing singular value decomposition on said terms-by-sentences as SVD is used to identify the term frequency matrix in documents as taught by Billheimer and summaries by scoring sentences as taught by Goldstein.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Billheimer teaching of SVD, and Goldstein's Sentence Extraction teaching, to include a means terms-by-sentences matrix to generate a singular value matrix as taught by of Goldstein. One of ordinary skill in the art would have been motivated to perform such a modification to produce a query-relevant summary base upon the a weighted sentence term-frequency vector and accordance with relevance to said weighted document (Goldstein at pages 121-122).

Regarding independent claim 29,

the rejection of claims 13 and 26 are fully incorporated.

Regarding claim 2, the rejection of claims 9 and 13 are fully incorporated.

In addition, Billheimer teaches:

selectively repeating said computing, said selecting,

(See, Billheimer at col. 8 lines 60-65, teaching a display and user interactive interface is provided.

Also, see Billheimer at col. 9 lines 55-65, teaching the logic decision function (capable of repeating the operation as long as needed).)

Regarding claim 3, Billheimer and Goldstein's Sentence Extraction do not explicitly teach,

But Goldstein teaches:

the method of claim 2 wherein said selectively repeating is terminated when a predetermined number of sentences has been selected.

(See, Goldstein at page 122, teaching a fixed–length generic summary is produced. Using the broadest reasonable interpretation, the examiner equates the claimed a predetermined number of sentences as equivalent to a fixed–length generic summary as taught by Goldstein.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Billheimer, and Goldstein's Sentence, to include a means of selectively repeating is terminated when a predetermined number of sentences has been selected. One of ordinary skill in the art would have been motivated to perform such a modification to produce a query-relevant summary base upon the a weighted sentence term-frequency vector and accordance with relevance to said weighted document (Goldstein at pages 121-122) and provides document summarization by sentence extraction as taught by Goldstein's Sentence Extraction.)

Regarding claim 4, Billheimer and Goldstein's Sentence Extraction do not explicitly teach,

But Goldstein teaches:

calculating an inner product of said weighted sentence term-frequency vector and said weighted document term-frequency vector

(See, Goldstein at pages 121-122, discloses the method of generating summaries by text extraction, wherein each sentence is scored according to the following formula and then ordered in a summary according to rank order.

$$Score(S_i) = \lambda \sum_{s \in S} w_s * (Q_s \cdot S_i) + (1 - \lambda) * \sum_{l \in L} w_l * (L_l \cdot S_i)$$

where S is the set of statistical features, L is the set of linguistic features, Q is the query, and w is the weights for the features in that set. These weights can be tuned according

to the type of data set used and the type of summary desired, wherein scoring sentences with respect to both statistical and linguistic features such that a centroid query vector is calculated using high frequency document words and the title of the document wherein each sentence is scored accordingly (e.g. using Score formula on page 122). The evaluators also marked each document as relevant or not relevant to the topic and selected the three most relevant sentences for each article from the sentences that they had marked relevant (yielding a most relevant sentence data set of 1-9 sentences per document). This set has an average of 5.6 sentences per document and 58.2% of the relevant sentence summaries contain the first sentence. An ideal query-relevant text summary must contain the relevant information to fulfill a user's information seeking goals, as well as eliminates irrelevant and redundant information) Examiner read the above in the broadest reasonable interpretation to the claim limitation, wherein the inner product of a weighted sentence term-frequency vector and relevance to said weighted document would have been an obvious variant of calculation of a centroid query vector such as

$$Score(S_i) = \lambda \sum_{s \in S} w_s * (Q_s \cdot S_i) + (1 - \lambda) * \sum_{l \in L} w_l * (L_l \cdot S_i)$$

since inner product is well known mathematical method of an operation on two vectors, which produces a scalar and then ordered in a summary according to rank order, to a person of ordinary skill in the art at the time the invention was made.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Billheimer, and Goldstein's Sentence, to include

a means of calculating an inner product of said weighted sentence term-frequency vector as taught by Goldstein. One of ordinary skill in the art would have been motivated to perform such a modification to produce a query-relevant summary base upon the a weighted sentence term-frequency vector and accordance with relevance to said weighted document (Goldstein at pages 121-122) and provides document summarization by sentence extraction as taught by Goldstein's Sentence Extraction.)

Regarding claim 5, Billheimer and Goldstein's Sentence Extraction do not explicitly teach,

but Goldstein teaches:

> **wherein said creating a weighted sentence term-frequency vector comprises implementing a local weighting function and implementing a global weighting function.**

(See, Goldstein at pages 121-122, discloses the method of generating summaries by text extraction, wherein scoring sentences with respect to both statistical and linguistic features such that a centroid query vector is calculated using high frequency document words and the title of the document wherein each sentence is scored accordingly (e.g. using Score formula on page 122) and then ordered in a summary according to rank order. Using the broadest reasonable interpretation, the Examiner equates the claimed a local weighting function and implementing a global weighting function as equivalent to scoring sentences with respect to both statistical and linguistic features such that a centroid query vector as taught by Goldstein.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Billheimer, and Goldstein's Sentence, to include a means of creating a weighted sentence term-frequency vector comprises implementing a local weighting function and implementing a global weighting function as taught by Goldstein One of ordinary skill in the art would have been motivated to perform such a modification to produce a query-relevant summary base upon the a weighted sentence term-frequency vector and accordance with relevance to said weighted document (Goldstein at pages 121-122) and provides document summarization by sentence extraction as taught by Goldstein's Sentence Extraction.)

Regarding claim 6, the rejection of claim 4 is fully incorporated.

In addition, Billheimer and Goldstein's Sentence Extraction do not explicitly teach,

but Goldstein teaches:

normalizing each said weighted sentence term-frequency vector.

(See, Goldstein at pages 121-125, discloses the method of generating summaries by text extraction, wherein analysis of news-article summaries generated by sentence selection. Sentences are ranked for potential inclusion in the summary using a weighted combination of statistical and linguistic features. The statistical features were adapted from standard IR methods. The potential linguistic ones were derived from an analysis of news-wire summaries. To evaluate these features we use a normalized version of precision-recall curves, with a baseline of random

sentence selection (see the normalized version as formulas (1) and (2) on page 125 for details).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Billheimer, and Goldstein's Sentence, to include a means of normalizing each said weighted sentence term-frequency vector as taught by Goldstein One of ordinary skill in the art would have been motivated to perform such a modification to produce a query-relevant summary base upon the a weighted sentence term-frequency vector and accordance with relevance to said weighted document (Goldstein at pages 121-122) and provides document summarization by sentence extraction as taught by Goldstein's Sentence Extraction.)

Regarding claim 7, Billheimer teaches:

creating a weighted document term-frequency vector comprises implementing a local weighting function and implementing a global weighting function

(Billheimer at col. 4, line 35 through col. 6, line 40, discloses an information retrieval method, wherein term and document visualization, term and document clustering, term and document classification, summarization of individual documents and groups of documents, and document cross-referencing. This is accomplished by representing the text of a document collection using subspace transformations. This subspace transformation representation is performed by: constructing a term frequency matrix of the term frequencies for each of the documents, transforming the term frequencies for

statistical purposes, and projecting the documents or the terms into a lower dimensional subspace. Examiner read the above in the broadest reasonable interpretation to the claim limitation, wherein implementing a local weighting function and implementing a global weighting function would have been an obvious variant of constructing a term frequency matrix of the term frequencies for each of the documents, transforming the term frequencies for statistical purposes, and projecting the documents or the terms into a lower dimensional subspace, to a person of ordinary skill in the art at the time the invention was made.

Regarding claim 8, Billheimer and Goldstein's Sentence Extraction do not explicitly teach,

but Goldstein teaches:

creating a weighted document term-frequency vector comprises normalizing each said weighted document term-frequency vector.

(See, Goldstein at pages 121-125, discloses the method of generating summaries by text extraction, wherein analysis of news-article summaries generated by sentence selection. Sentences are ranked for potential inclusion in the summary using a weighted combination of statistical and linguistic features. The statistical features were adapted from standard IR methods. The potential linguistic ones were derived from an analysis of news-wire summaries. To evaluate these features we use a normalized version of precision-recall curves, with a baseline of random

sentence selection (see the normalized version as formulas (1) and (2) on page 125 for details).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have combined Billheimer, and Goldstein's Sentence, to include a means of creating a weighted document term-frequency vector comprises normalizing each said weighted document term-frequency vector as taught by Goldstein One of ordinary skill in the art would have been motivated to perform such a modification to produce a query-relevant summary base upon the a weighted sentence term-frequency vector and accordance with relevance to said weighted document (Goldstein at pages 121-122) and provides document summarization by sentence extraction as taught by Goldstein's Sentence Extraction.)

Regarding claim 10, the rejection of claim 9 is fully incorporated.

In addition, Billheimer teaches:

> ***the system of claim 9 wherein said vector generator recreates said weighted document term-frequency vector in accordance with output results***.

(Billheimer at col. 4, line 35 through col. 6, line 40, discloses subspace transformation representation is performed by: constructing a term frequency matrix of the term frequencies for each of the documents, transforming the term frequencies for statistical purposes, and projecting the documents or the terms into a lower dimensional subspace. Using the broadest reasonable interpretation, the Examiner equates the

claimed weighted document term-frequency vector in accordance with output results as equivalent to term frequencies for statistical purposes, and projecting the documents or the terms into a lower dimensional subspace as taught by Billheimer.

Regarding claim 11, the rejection of claims 2 and 9 are fully incorporated.

In addition, Billheimer teaches:

the system of claim 10 wherein said summarizer further comprises a loop routine for generating iterative sequential operations.

(Billheimer at col. 4, line 35 through col. 6, line 40, discloses subspace transformation representation is performed by: constructing a term frequency matrix of the term frequencies for each of the documents, transforming the term frequencies for statistical purposes, and projecting the documents or the terms into a lower dimensional subspace. Using the broadest reasonable interpretation, the Examiner equates the claimed loop routine as equivalent projecting the documents or the terms into a lower dimensional subspace as taught by Billheimer.

Regarding claim 12, the rejection of claim 3 is fully incorporated.

Regarding claims 14-20, the rejection of claims 2-8 are fully incorporated respectively.

Regarding claims 22-23, the rejection of claims 2-3 is fully incorporated respectively.

Regarding claim 24, Goldstein's Sentence Extraction does not explicitly teach, but Billheimer and Goldstein teach:

The method of claim 21 wherein said selecting further comprises identifying a sentence having a desired index value with said right singular vector.

(See, Billheimer at col. 3 lines 55-60, teaching latent semantic indexing (LSI), and singular value decomposition (SVD).

Also, see Goldstein at page 122 section 2 Generating Summaries by Text Extraction para 3, teaching summaries by scoring sentences. Using the broadest reasonable interpretation the Examiner equates the claimed a sentence having a desired index value with said right singular vector as equivalent to SVD is used to identify the term frequency matrix in documents as taught by Billheimer and summaries by scoring sentences as taught by Goldstein.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified Billheimer teaching of SVD, and Goldstein's Sentence Extraction teaching, to include a means terms-by-sentences matrix to generate a singular value matrix as taught by of Goldstein. One of ordinary skill in the art would have been motivated to perform such a modification to produce a query-relevant summary base upon the a weighted sentence term-frequency vector and accordance with relevance to said weighted document (Goldstein at pages 121-122).

Regarding claim 25, the rejection of claim 5 is fully incorporated.

Regarding claims 27-28, the rejection of claims 11-12 are fully incorporated respectively.

Regarding claims 30-32, the rejection of claims 23-25 are fully incorporated respectively.

It is noted that any citations to specific, pages, columns, lines, or figures in the prior art references and any interpretation of the references should not be considered to be limiting in any way. A reference is relevant for all it contains and may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art. See, MPEP 2123.

Response to Arguments

Brief description of cited prior art:

Billheimer [hereinafter Billheimer] discloses a methodology and system for text mining, where each sentence in the document collection is pared and generated a semantic interpretation (See Billheimer at Column 2, Lines 45-50). Also, Billheimer discloses summarization of individual documents and groups of documents, and document cross-referencing using a term frequency matrix of the term frequencies for each of the

documents (i.e. a weighted document term-frequency vector) (See, Billheimer at col. 4, line 35 through col. 6, line 40).

Goldstein "Summarization By Sentence Extraction and Evaluation Metrics" [hereinafter Goldstein1] discloses a method of summarizing text documents: sentence selection and evaluation metrics (See Goldstein1 the Title). Also, Goldstein method teaching of generating summary of a document by sentence selection potential inclusion of sentence ranking (See Goldstein1 the Abstract); Goldstein's method focusing of: summarization by text-span extraction, where the text-span attraction using the methodology that assigned weighted scores for both statistical and linguistic using abstractor that allows query relevant summary by scoring sentences; a centroid query is calculated using high frequency document words (each sentence is scored using the following formula and then ordered in a summary according the rank order,

$$Score(S_i) = \lambda \sum_{s \in S} w_s * (Q_s \cdot S_i) + (1 - \lambda) * \sum_{l \in L} w_l * (L_l \cdot S_i)$$

where S is the set of statistical features,

L is the set of linguistic features,

Q is the query, and

w is the weights for the features in that set.

These weights can be tuned according to the type of data set used and the type of summary desired (See Goldstein1 Page 121, Section 1 Right Column second and fourth Para, also Page 122 section 2 Left Column).

Goldstein " Multi-Document Summarization By Sentence Extraction" [hereinafter Goldstein2] discloses the text-span deletion to delete "less important" span of text from the original document; the text remain is a summary (See Goldstein2 Page 41, Section 2, Top half Left Column.)

Response to Remarks:

Beginning on page 2 of the Remarks (hereinafter the remarks), Applicant argues the following issues, which are accordingly addressed below.

Rejection of Claims 1-32 Under 35 U.S.C. § 103(a) over Billheimer, Goldstein1, and Goldstein2:

Regarding claims 1-32, Appellant argues, the combination Billheimer, Goldstein1, and Goldstein2 fail to teach the features of *" deleting said sentence from said document and for eliminating terms in said sentence from said document,"* because Billheimer, Goldstein1, and Goldstein2 do not teach or suggest:

i) identified features, See the remarks Page 2 Last Para Bottom.

ii) claims 1, 9, and 13 recite deletion of only the selected sentence itself, which has no effect on similar sentences, Thus the claimed deleting the sentence from said document and for eliminating terms in said sentence from said document is not the

same or equivalent to the use of the scoring formula shown in Goldstein2 Fig. 1, See the remarks Page 3 Bottom through Page 4 Top.

iii) as to claims 21, 26, and 29 recite singular value decomposition on the terms-by-sentences matrix to generate a singular value matrix and a right singular vector matrix. Specifically, neither Billheimer et al. nor Goldstein1 nor Goldstein2 ever mention the claimed (1) singular value matrix and (2) right singular vector matrix, See the remarks Pages 5.

Firstly: Regarding claims 1-32, Applicant argues, the combination of Billheimer, Goldstein1, and Goldstein2 fail to teach the features of *" deleting said sentence from said document and for eliminating terms in said sentence from said document,"* because Billheimer, Goldstein1, and Goldstein2 do not teach or suggest:

i) identified features, See the remarks Page 2 Last Paragraph, Bottom.

The examiner disagrees.

For purposes of responding to Applicant's argument, the examiner will assume that Applicant is arguing for the patentability of Claims 1, 9, and 13.

It is noted that the feature upon which Applicant relies (i.e., "identified features") is not recited in the rejected claims. That is, Claims 1, 9, and 13 do not recite any kind of a "identified features." Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Thus it is moot.

Secondly: Regarding claims 1-32, Applicant argues, the combination of Billheimer, Goldstein1, and Goldstein2 fail to teach the features of *" deleting said sentence from said document and for eliminating terms in said sentence from said document,"* because Billheimer, Goldstein1, and Goldstein2 do not teach or suggest:

ii) claims 1, 9, and 13 recite deletion of only the selected sentence itself, which has no effect on similar sentences, Thus the claimed deleting the sentence from said document and for eliminating terms in said sentence from said document is not the same or equivalent to the use of the scoring formula shown in Goldstein2 Fig. 1, See the remarks Page 3 Bottom through Page 4 Top.

The examiner disagrees.

For purposes of responding to Applicant's argument, the examiner will assume that Applicant is arguing for the patentability of Claims 1, 9, and 13.

As discuss in the rejection above, Specifically Goldstein1 discloses the method of generating summaries by text extraction, wherein sentence is scored using a centroid query vector. As illustrates in equation bellows, how the Score (Si) is obtaining form the documents:

$$Score(S_i) = \lambda \sum_{s \in S} w_s * (Q_s \cdot S_i) + (1 - \lambda) * \sum_{l \in L} w_l * (L_l \cdot S_i)$$

where S is the set of statistical features,

L is the set of linguistic features,

Q is the query, and w is the weights for the features in that set.

These weights can be tuned according to the type of data set used and the type of summary desired (see Goldstein1 page 121-124 section 1-4).

In addition, the Examiner introduces Goldstein2, for example, discloses the text-span deletion to delete "less important" span of text from the original document; the text remain is a summary (See Goldstein2 Page 41, Section 2, Top half Left Column.)

Applicant's specification cites, ""terms-by-sentences" matrix of the entire document may be created. A singular value decomposition technique may be applied to the terms-by-sentences matrix such that all the sentences from the document may be projected into the singular vector space. A system and method of generic text summary may then select the sentences having the largest index values with the most important singular vectors as part of the text summary." See Applicant's specification Para 18 (US 20020138528A1). Also, the Applicant's specification cites, "Query-relevant text summaries such as those mentioned above (Para 14) may be useful for determining whether a given document is relevant to a user's query, and, if a document is relevant, for identifying which part of the document is related to the query. Since query-relevant summaries are created responsive to particular queries.... Generic text summarization techniques must be developed for identifying key topics within documents and for categorizing those documents", See Applicant's specification Para 14-15 (US 20020138528A1).

Accordingly, at the time the invention was made, one of ordinary skill in the art could have uses Goldstein1's method of summarizing text documents: sentence

selection and evaluation metrics (See Goldstein1 the Title). Also, Goldstein1 teaching generating summary of a document by sentence selection potential inclusion of sentence ranking (See Goldstein1 the Abstract); Goldstein's method focusing of: summarization by text-span extraction, where the text-span attraction using the methodology that assigned weighted scores for both statistical and linguistic using abstractor that allows query relevant summary by scoring sentences; a centroid query is calculated using high frequency document words (each sentence is scored using the following formula and then ordered in a summary according the rank order, wherein *sentence is scored using a centroid query vector.* As illustrates in equation bellows, how the Score (Si) is obtaining form the documents:

$$Score(S_i) = \lambda \sum_{s \in S} w_s * (Q_s \cdot S_i) + (1 - \lambda) * \sum_{l \in L} w_l * (L_l \cdot S_i)$$

where S is the set of statistical features,

L is the set of linguistic features,

Q is the query, and w is the weights for the features in that set.

These weights can be tuned according to the type of data set used and the type of summary desired (see Goldstein1 page 121-124 section 1-4). By using the result form Goldstein1, to include means of the text-span deletion to delete "less important" span of text from the original document; the text remain is a summary as taught by Goldstein2 (See Goldstein2 Page 41, Section 2, Top half Left Column.), could have yielded predictable result to one of the ordinary skill in the art at the time of the invention. As disclose in Goldstein1, to produce a query-relevant summary base upon

the a weighted sentence term-frequency vector and accordance with relevance to said weighted document (Goldstein at pages 121-122), which is the same results as describes by the Applicant's claimed invention as cites in Para 14-15, and Para 18 mention above.

Moreover, following KSR direction as following: "SUPREME COURT OF THE UNITED STATES No. 04–1350 KSR INTERNATIONAL CO., PETITIONER v. TELEFLEX INC. ET AL. ON WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT [April 30, 2007], (page 2-3 of the court opinion) Following Graham v. John Deere Co. of Kansas City, 383 U. S. 1 (1966), the Court set out a framework for applying the statutory language of §103, language itself based on the logic of the earlier decision in Hotchkiss v. Greenwood, 11 How. 248 (1851), and its progeny. See 383 U. S., at 15–17. The analysis is objective:

> "Under §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented." Id., at 17–18.

While the sequence of these questions might be reordered in any particular case, the factors continue to define the inquiry that controls. If a court, or patent examiner, conducts this analysis and concludes the claimed subject matter was obvious, the claim is invalid under §103. Seeking to resolve the question of obviousness with more uniformity and consistency, the Court of Appeals for the Federal Circuit has employed an approach referred to by the parties as the "teaching, suggestion, or motivation" test (TSM test), under which a patent claim is only proved obvious if "some motivation or suggestion to combine the prior art teachings" can be found in the prior art, the nature of the problem, or the knowledge of a person having ordinary skill in the art. See, e.g., Al-Site Corp. v. VSI Int'l, Inc., 174 F. 3d 1308, 1323–1324 (CA Fed. 1999). KSR challenges that test, or at least its application in this case. See 119 Fed. Appx. 282, 286–290 (CA Fed. 2005). Because the Court of Appeals addressed the question of obviousness in a manner contrary to §103 and our precedents, we granted certiorari, 547 U. S ___ (2006). We now reverse.

Using the broadest reasonable interpretation, and cites evidences above, the Examiner had found that Goldstein1 in view of Goldstein2 have taught all the limitations of the claimed invention, thus Billheimer need not teach these limitations to support a proper 103 rejection.

In addition, As discuss in the Response to remarks cites above, thus the examiner has established "some motivation or suggestion to combine the prior art teachings" can be found in the prior art, the nature of the problem, or the knowledge of a person having ordinary skill in the art. See, e.g., Al-Site Corp. v. VSI Int'l, Inc., 174 F. 3d 1308, 1323–1324 (CA Fed. 1999). KSR challenges that test, or at least its application in this case. See 119 Fed. Appx. 282, 286–290 (CA Fed. 2005).

Thirdly: Regarding claims 1-32, Applicant argues, the combination of Billheimer, Goldstein1, and Goldstein2 fail to teach the features of *" deleting said sentence from said document and for eliminating terms in said sentence from said document,"* because Billheimer, Goldstein1, and Goldstein2 do not teach or suggest:

iii) as to claims 21, 26, and 29 recite singular value decomposition on the terms-by-sentences matrix to generate a singular value matrix and a right singular vector matrix. Specifically, neither Billheimer et al. nor Goldstein1 nor Goldstein2 ever mention the claimed (1) singular value matrix and (2) right singular vector matrix, See the remarks Pages 5.

The examiner disagrees.

For purposes of responding to Applicant's argument, the examiner will assume that Applicant is arguing for the patentability of Claims 21, 26, and 29.

As discuss in the rejection above, Specifically Billheimer discloses a method and system for text mining of doucments using the known method of Latent Semantic Indexing (LSI) or Single Value Decomposition (SVD) or SDD to measure the important of each featue of a document (see Billheimer col. 3, lines 55-60). Accordingly, these exist method of Latent Semantic Indexing (LSI) or Single Value Decomposition (SVD) or SDD to result a mechanism for labeling the data with meaningful terms that characterize the semantic dimensions of the document collection, as well as supporting visual exploration of the data. Traditional vector space models treat individual documents as vectors in a high-dimensional vector space in which each dimension corresponds to some feature of a document.

Moreover, Billheimer describes, a collection of documents can therefore be represented by a two-dimensional matrix A [fxd] of features, and documents, where features correspond to document terms and the value of each feature is the frequency of that term in the specified document.

For example, if term t1 occurs four times in document d1, then A [1,1] is set to 4. Similarly, if term t2 does not occur in d1, then A [2,1] is set to 0. More complex types of vector space methods, such as latent semantic indexing (LSI), involve different methods to compute the elements in A, e.g. singular value decomposition (SVD) or semi-discrete decomposition (SDD), typically attempting to provide a more sophisticated set of

features and a better measure of the importance of each feature in a document as taught by Billheimer at Column 3, Lines 45-60, to include a means of summarizing text documents: sentence selection and evaluation metrics (See Goldstein1 the Title).

Also, Goldstein1 teaches generating summary of a document by sentence selection potential inclusion of sentence ranking (See Goldstein1 the Abstract); Goldstein1's method focusing of: summarization by text-span extraction, where the text-span attraction using the methodology that assigned weighted scores for both statistical and linguistic using abstractor that allows query relevant summary by scoring sentences; a centroid query is calculated using high frequency document words (each sentence is scored using the following formula and then ordered in a summary according the rank order, wherein *sentence is scored using a centroid query vector.* As illustrates in equation bellows, how the Score (Si) is obtaining form the documents:

$$Score(S_i) = \lambda \sum_{s \in S} w_s * (Q_s \cdot S_i) + (1 - \lambda) * \sum_{l \in L} w_l * (L_l \cdot S_i)$$

where S is the set of statistical features,

L is the set of linguistic features,

Q is the query, and w is the weights for the features in that set.

These weights can be tuned according to the type of data set used and the type of summary desired as taught by Goldstein1 (see Goldstein1 page 121-124 section 1-4).

By using the result form Goldstein1, and further to includes a means of *the text-span deletion to delete "less important" span of text from the original document*; the text

remain is a summary as taught by Goldstein2 (See Goldstein2 Page 41, Section 2, Top half Left Column.), could have yielded predictable result to one of the ordinary skill in the art at the time of the invention. As disclose in Goldstein1, to produce a query-relevant summary base upon the a weighted sentence term-frequency vector and accordance with relevance to said weighted document (Goldstein at pages 121-122), which is the same results as describes by the Applicant's claimed invention as cites in Para 14-15, and Para 18 mention above.

As describes by the Applicant's specification, "Given a matrix, A, of dimensions m x n, where V=[v.sub.1j] is an n x n orthogomal matrix whose columns are called right singular vectors,... where each column vector A.sub.i represents the weighted term-frequency vector of a sentence, i, in the document under consideration. If there are a total of m terms and n sentences in the document, then the terms-by-sentences matrix A for the entire document will have dimensions of mxn. Since every word does not normally appear in each sentence, the matrix A is usually sparse. From a semantic point of view, the SVD technique may enable the summarizer to derive the latent semantic structure of the document represented by the matrix A (see, e.g., S. Deerwester et al., Indexing By Latent Semantic Analysis, Journal of the American Society for Information Science, vol. 41, pp. 391-407, 1990). This operation may reflect a breakdown of the original document into a number, r, of linearly-independent base vectors or concepts; Each term and sentence from the document may be jointly indexed by these base vectors and concepts. A unique SVD feature which is lacking in conventional IR technologies is that the SVD may generally be capable of capturing and

modeling the interrelationships among terms such that semantic clusters of terms and sentences may be created," see Applicant 's specification Para 47-50. Using the broadest reasonable interpretation, the Examiner equates the claimed (1) singular value matrix and (2) right singular vector matrix as equivalent to Single Value Decomposition (SVD) where traditional vector space models treat individual documents as vectors in a high-dimensional vector space in which each dimension corresponds to some feature of a document as taught by Billheimer, because the SVD gains result by degenerate singular values, measure the important of each featue of a document , where traditional vector space models treat individual documents as vectors in a high-dimensional vector space in which each dimension corresponds to some feature of a document.

Accordingly, at the time the invention was made, one of ordinary skill in the art could have uses the known method of Latent Semantic Indexing (LSI) or Single Value Decomposition (SVD) or SDD of Billheimer to substitute for (1) singular value matrix and (2) right singular vector matrix as claimed to improved the text-span deletion to delete "less important" span of text from the original document to produce a query-relevant summary base upon the a weighted sentence term-frequency vector and accordance with relevance to said weighted document (Goldstein at pages 121-122), which is the same results as describes by the Applicant's claimed invention as cites in Para 14-15, and Para 18 mention above.

Moreover, following KSR direction as following: "SUPREME COURT OF THE UNITED STATES No. 04–1350 KSR INTERNATIONAL CO., PETITIONER v. TELEFLEX INC. ET AL. ON WRIT OF CERTIORARI TO THE UNITED STATES COURT OF

APPEALS FOR THE FEDERAL CIRCUIT [April 30, 2007], (page 2-3 of the court opinion)

Following Graham v. John Deere Co. of Kansas City, 383 U. S. 1 (1966), the Court set out a framework for applying the statutory language of §103, language itself based on the logic of the earlier decision in Hotchkiss v. Greenwood, 11 How. 248 (1851), and its progeny. See 383 U. S., at 15–17. The analysis is objective:

> "Under §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented." Id., at 17–18.

While the sequence of these questions might be reordered in any particular case, the factors continue to define the inquiry that controls. If a court, or patent examiner, conducts this analysis and concludes the claimed subject matter was obvious, the claim is invalid under §103. Seeking to resolve the question of obviousness with more uniformity and consistency, the Court of Appeals for the Federal Circuit has employed an approach referred to by the parties as the "teaching, suggestion, or motivation" test (TSM test), under which a patent claim is only proved obvious if "some motivation or suggestion to combine the prior art teachings" can be found in the prior art, the nature of the problem, or the knowledge of a person having ordinary skill in the art. See, e.g., Al-Site Corp. v. VSI Int'l, Inc., 174 F. 3d 1308, 1323–1324 (CA Fed. 1999). KSR challenges that test, or at least its application in this case. See 119 Fed. Appx. 282, 286–290 (CA Fed. 2005). Because the Court of Appeals addressed the question of obviousness in a manner contrary to §103 and our precedents, we granted certiorari, 547 U. S ___ (2006). We now reverse.

Using the broadest reasonable interpretation, and cites evidences above, the Examiner had found that Billheimer, Goldstein1 in view of Goldstein2 have taught all the limitation of the claimed invention.

In addition, As discuss in the Response to remarks cites above, thus the examiner has established "some motivation or suggestion to combine the prior art teachings" can be found in the prior art, the nature of the problem, or the knowledge of a person having ordinary skill in the art. See, e.g., Al-Site Corp. v. VSI Int'l, Inc., 174 F. 3d 1308, 1323–1324 (CA

Fed. 1999). KSR challenges that test, or at least its application in this case. See 119 Fed. Appx. 282, 286–290 (CA Fed. 2005).

Therefore, Billheimer, Goldstein1 in view of Goldstein2 clearly teach, *"(1) singular value matrix and (2) right singular vector matrix"*. And 103(a) rejection is proper.

Accordingly, for at least all the above evidence, therefore the Examiner respectfully maintains the rejection of claims 1-32, at this time.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quoc A. Tran whose telephone number is 571-272-8664. The examiner can normally be reached on Monday through Friday from 9 AM to 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doug Hutton can be reached on 571-272-4137. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Quoc A. Tran
Patent Examiner
08/10/2007

8/10/07

/Doug Hutton/
Supervisory Primary Examiner
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